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PATENT

#51632
4/26/02

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In Re Application of:

Joe Z. Tsien

Serial No.: 10/009,228

Group Art Unit: Not Yet Assigned

Filing Date: March 12, 2002

Examiner: Not Yet Assigned

For: COMPOSITION AND METHODS FOR IMPROVING LEARNING AND MEMORY

DATE OF DEPOSIT: 4/16/02

I HEREBY CERTIFY THAT THIS PAPER IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST CLASS MAIL, POSTAGE PREPAID ON THE DATE INDICATED ABOVE AND IS ADDRESSED TO THE ASSISTANT COMMISSIONER FOR PATENTS, WASHINGTON, DC 20231.

TYPED NAME: Janet E. Reed
REGISTRATION NO.: 36,252

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

INFORMATION DISCLOSURE STATEMENT

Pursuant to 37 C.F.R. §1.56 and in accordance with 37 C.F.R. §§1.97-1.98, information relating to the above-identified application is hereby disclosed. Inclusion of information in this statement is not to be construed as an admission that this information is material as that term is defined in 37 C.F.R. §1.56(b).

- ☒ In accordance with §1.97(b), since this Information Disclosure Statement is being filed either within three months of the filing date of the above-identified application, within three months of the date of entry into the national stage of the above identified application as set forth in §1.491, before the mailing date of a first Office Action on the merits of the above-identified application, or before the mailing date of a first office action after the filing of request for continued examination under §1.114, no additional fee is required.

- ☐ In accordance with §1.129(a), this Information Disclosure Statement is being filed in connection with ☐the first or ☐second After Final Submission, therefore:
- ☐ Certification in Accordance with §1.97(e) is attached; or
- ☐ The fee of \$180.00 as set forth in §1.17(p) is attached.
- ☐ In accordance with §1.97(c), this Information Disclosure Statement is being filed after the period set forth in §1.97(b) above but before the mailing date of either a Final Action under §1.113 or a Notice of Allowance under §1.311, or before an action that otherwise closes prosecution in the application, therefore:
- ☐ Certification in Accordance with §1.97(e) is attached; or
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- ☐ In accordance with §1.97(d), this Information Disclosure Statement is being filed after the mailing date of either a Final Action under §1.113 or a Notice of Allowance under §1.311 but before, or simultaneously with, the payment of the Issue Fee, therefore included are: Certification in Accordance with §1.97(e); and the submission fee of \$180.00 as set forth in §1.17(p).
- ☒ Copies of each of the references listed on the attached Form PTO-1449 are enclosed herewith.
- ☐ Copies of references listed on the attached Form PTO-1449 are enclosed herewith EXCEPT THAT:
- ☐ In view of the voluminous nature of references [list as appropriate], and the likelihood that these references are available to the Examiner, copies are not enclosed herewith.

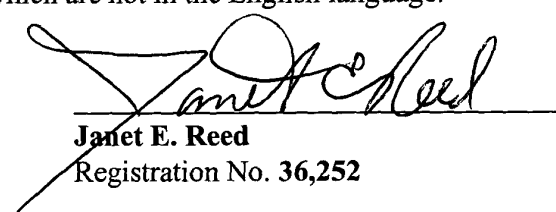
- ☐ In accordance with §1.98(d), copies of the following references listed on the attached Form PTO-1449 are not enclosed herewith because they were previously cited by or submitted to the U.S. Patent and Trademark Office in patent application(s) for which a claim for priority under 35 U.S.C. §120 have been made in the instant application:
- ☐ Copies of references [list as appropriate] listed on the attached Form PTO-1449 were previously cited by or submitted to the Patent and Trademark Office in prior application Serial No. , filed .
- ☐ If any of the foregoing publications are not available to the Examiner, Applicant will endeavor to supply copies at the Examiner's request.

Please charge any deficiency or credit any overpayment to Deposit Account No. 23-3050.
This form is submitted in duplicate.

Attached is a copy of the PCT International Search Report dated **October 3, 2000**, which indicates the documents considered to be relevant.

There are no listed references which are not in the English language.

Date: 4/16/02


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Form PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office		Docket No. PU-0082	Serial No. 0009228
		Applicant Joe Z. Tsien	
		Filing Date March 12, 2002	Group Not Yet Assigned

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OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)		
*	AA	Ausubel, et al., <i>Current Protocols in Molecular Biology</i> , 1999 (Too Vol)
	AB	Brinster, R.L. et al., "Factors affecting the efficiency of introducing foreign DNA into mice by microinjecting eggs", <i>Proc. Natl. Acad. Sci. USA</i> , 1985, 82, 4438-4442
	AC	Capecchi, M.R., "Altering the genome by homologous recombination", <i>Science</i> , 1989, 244, 1288-1292
	AD	Carmignoto & Vicini, "Activity-Dependant decrease in NMDA receptor responses during development of the visual cortex", <i>Science</i> , 1992, 258, 1007-11
*	AE	Davis, et al., "In: The psychology of learning and memory", 1987, Bower, G.H (ed)
	AF	Dudek, S.M. et al., "Bidirectional long-term modification of synaptic effectiveness in the adult and immature hippocampus", <i>J. Neuroscience</i> , 1993, 13, 2910-2918
	AG	Falls, W.A. et al., "Extinction of fear-potentiated startle: Blockade by infusion of an NMDA antagonist into the amygdala", <i>J. Neuroscience</i> , 1992, 12, 854-863
	AH	Harris, K.M. et al., "Developmental onset of long-term potentiation in area ca1 of the rat hippocampus", <i>J. Physiol. (Lond)</i> 1984, 346, 27-48
	AI	Hestrin, S., "Developmental regulation of NMDA receptor-mediated synaptic currents at a central synapse", <i>Nature</i> , 1992, 357, 686-689

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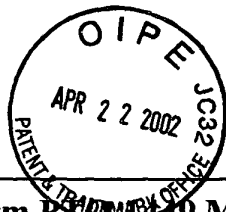
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		Applicant Joe Z. Tsien	
		Filing Date March 12, 2002	Group Not Yet Assigned
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)			
*	AJ	Hogan, et al., "Manipulating in the Mouse Embryo- A Laboratory Manual," Cold Spring Harbor Laboratory Press, 1994	
	AK	Hollman & Heinemann, "Cloned glutamate receptors", <i>Annu. Rev. Neurosci</i> , 1994, 17, 31-108	
*	AL	Joyner, "Gene Targeting," IRL Press, Oxford, 1993	
	AM	Joyner, A.L. et al., "Production of a mutation in mouse En-2 gene by homologous recombination in embryonic stem cells", <i>Nature</i> , 1989, 338, 153-156	
	AN	Kim, J.J. et al., "Selective impairment of long-term but not short-term conditional fear by the N-Methyl-d-aspartate antagonist APV", <i>Behav. Neurosci</i> , 1992, 106, 591-596	
	AO	Liu, G. et al., "Variability of neurotransmitter concentration and nonsaturation of postsynaptic AMPA receptors at synapses in hippocampal cultures and slices", <i>Neuron</i> , 1999, 22, 395-409	
	AP	Mayford, M. et al., "CaMK11 regulates the frequency-response function of hippocampal synapses for the production of both LTD and LTP", <i>Cell</i> , 1995, 81, 891-904	
	AQ	McHugh, T.J. et al., "Impaired hippocampal representation of space in CA1-specific NMDAR1 knockout mice" <i>Cell</i> , 1996, 87, 1339-1349	
	AR	Migaud, M. et al., "Enhanced long-term potentiation and impaired learning in mice with mutant postsynaptic density-95 protein", <i>Nature</i> , 1998, 396, 433-439	
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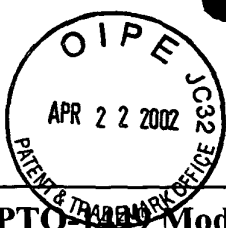
Form PTO-49 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office	Docket No. PU-0082	Serial No. 10/009,228
	Applicant Joe Z. Tsien	
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OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

AS	Monyer, H. et al., "Heteromeric NMDA receptors: Molecular and functional distinction of subtypes", <i>Science</i> , 1992 , 256, 1217-1221
AT	Monyer, H. et al., "Developmental and regional expression in the rat brain and functional properties of four NMDA receptors", <i>Neuron</i> , 1994 , 12, 529-540
AU	Morris, R.G.M. et al., "Place navigation impaired in rats with hippocampal lesions", <i>Nature</i> , 1982 , 24, 681-683
AV	Mumby, D.G. et al., "Ischemia-Induced object-recognition deficits in rats are attenuated by hippocampal ablation before or soon after ischemia", <i>Behav. Neurosci</i> , 1996 , 110, 266-281
AW	Myhrer, T. "Exploratory behavior and reaction to novelty in rats with hippocampal perforant path systems disrupted", <i>Behav. Neurosci</i> , 1988 , 102, 356-362
AX	Nakanishi, S., "Molecular diversity of glutamate receptors and implications for brain function", <i>Science</i> , 1992 , 258, 597-603
AY	Okabe, S. et al., "Hippocampal synaptic plasticity in mice overexpressing an embryonic subunit of the NMDA receptor", <i>J. Neurosci</i> , 1998 , 18, 4177-4188
AZ	Phillips, R.G. et al., "Differential contribution of amygdala and hippocampus to cued and contextual fear conditioning", <i>Behav. Neurosci</i> , 1992 , 106, 274-285
BA	Reed, J.M. et al., "Impaired recognition memory in patients with lesions limited to the hippocampal formation" <i>Behav. Neurosci</i> , 1997 , 111, 667-675
BB	Sheng, M. et al., "Changing subunit composition of heteromeric NMDA receptors during development of rat cortex", <i>Nature</i> , 1994 , 368, 144-147

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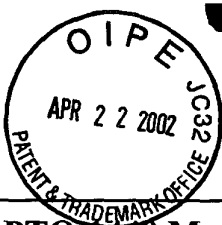
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	BC	Staubli, U. et al., "Factors regulating the reversibility of long-term potentiation", <i>J. Neurosci.</i> , 1996 , 16, 853-60
*	BD	Teratocarcinomas and Embryonic Stem Cells, A Practical Approach, 1987
	BE	Thomas, K.R. et al., "Site-directed mutagenesis by gene targeting in mouse embryo-derived stem cells", <i>Cell</i> , 1987 , 51, 503-512
	BF	Tsein, J.Z. et al., "The essential role of hippocampal CA1 NMDA receptor-dependant synaptic plasticity in spatial memory", <i>Cell</i> , 1996 , 87, 1327-1338
	BG	Tsien, J.Z. et al., "Subregion- and cell type-restricted gene knockout in mouse brain" <i>Cell</i> , 1996 , 87, 1317-26
	BH	Wagner, E.F. et al., "The human β -globin gene and a functional viral thymidine kinase gene in developing mice", <i>Proc. Natl. Acad. Sci.</i> , 1981 , 78, 5016-5020
*	BI	Wasserman, et al., "A guide to Techniques in Mouse Development", 1993 , Academic Press
	BJ	Leonard, et al., "Calcium/calmodulin-dependant protein kinase II is associated with the N-methyl-D-aspartate receptor", <i>Proc. Natl. Acad. Sci. USA</i> , 1999 , 96, 3239-3244
	BK	Petralia, et al., "The NMDA receptor subunits NR2A and NR2B show histological and ultrastructural localization patterns similar to those of NR1, <i>J. Neurosci.</i> , 1994 , 14(10), 6102-6120
	BL	Rosenblum, et al., "NMDA receptor and the tyrosine phosphorylation of its 2B subunit in taste learning in the rat insular cortex", <i>J. Neurosci.</i> , 1997 , 17(13), 5129-5135

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	BM	Sprengel, R. et al., "Importance of the intracellular domain of NR2 subunits for NMDS receptor function in vivo", <i>Cell</i> , 1998 , 92, 279-289	
	BN	Strack, et al., "Autophosphorylation-dependant targeting of calcium/calmodulin-dependent protein kinase II by the NR2B subunit of the N-methy-D-aspartate receptor", <i>J. Biol. Chem</i> , 1998 , 273(33), 20689-20692	
	BO	Shimizu, E. et al., "NMDA receptor-dependant synaptic reinforcement as a crucial process for memory consolidation", <i>Science</i> , 2000 , 290, 1170-1174	
	BP	Tang, Y.P. et al., "Differential effects of enrichment on learning and memory function in NR2B transgenic mice", <i>Neuropharmacology</i> , 2001 , 41, 779-790	
	BQ	Tsien, J. "Building a Brainer Mouse", <i>Scientific American</i> , 2000 , 42-48	
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